Title: Berry Fun Cooking

Brief Overview:

Using literature, students will gain an understanding of fractional parts of a whole, fair shares, and comparing fractions as related to measurement. With the use of card games, pattern blocks, and other hands-on activities, students will explore these concepts. Students will demonstrate knowledge of these concepts through a final cooking project involving measurement and equal distribution of strawberry shortcakes. This unit will promote a basic foundation and understanding of how fractions can be used in real-life situations.

NCTM 2000 Principles for School Mathematics:

- **Equity:** *Excellence in mathematics education requires equity - high expectations and strong support for all students.*
- **Curriculum:** *A curriculum is more than a collection of activities: it must be coherent, focused on important mathematics, and well articulated across the grades.*
- **Teaching:** *Effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well.*
- **Learning:** *Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.*
- **Assessment:** *Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.*
- **Technology:** *Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.*

Links to NCTM 2000 Standards:

- **Content Standards**

<u>Number and Operations</u>
Students will understand numbers and the various ways of representing them. They will understand relationships between numbers and how they relate to fractions. Students will gain an understanding of number operations, including addition, subtraction, and greater than and less than.

<u>Algebra</u>
Students should recognize patterns and their relationship to fractions. They will be able to use symbolic forms to represent fractional parts and utilize models to recognize fractions in real-life and abstract situations.

Geometry
Students will recognize two and three-dimensional objects that portray fractional pieces. They will use visual and spatial reasoning to solve problems that relate to math as well as other modalities.

Measurement
Students will recognize and understand the uses of various measuring devices and will be able to apply this knowledge to real-life situations. They will understand the practical uses of measuring instruments and which tool to use in a particular situation.

Data Analysis and Probability
Students will collect data as related to the story and apply it to solve a problem through predicting and evaluating the information into a written representation.

- **Process Standards**

Problem Solving
Students will use mathematical knowledge to formulate, represent, and generalize problem solving as it relates to math. They will then apply these techniques to solve problems presented to them through their data collections.

Reasoning and Proof
Students will use reasoning and proof to investigate various mathematical situations and develop arguments to explain their decisions. They will use decision-making processes to discover which types of mathematical strategies would be best for solving their problems.

Communication
Students will use communication skills through the knowledge of various mathematical vocabularies and be able to communicate that knowledge in an appropriate manner to their teacher and peers.

Connections
Students will recognize that various mathematical strategies can be used outside of the math classroom and will be able to link strategies to develop and apply original concepts.

Representation
Students will be able to use different representations to organize and communicate mathematical ideas. They will be able to use models and physical and social representations to demonstrate knowledge of these concepts.

Grade/Level:

Grades 2 and 3 (also would be excellent for functional life skills in a Special Education Class)

Duration/Length:

This unit will take approximately four class periods of 45-60 minutes.

Prerequisite Knowledge:

Students should have working knowledge of the following skills:

- Basic understanding of part/whole relationships
- Basic problem solving skills and math vocabulary
- Basic whole number operations
- Greater than and less than symbols
- Identifying fractions

Student Outcomes:

Students will:

- work cooperatively in groups.
- understand fractional parts of a whole.
- compare fractions.
- understand the concept of fair shares.
- use written expression/illustration to explain how fractions compare.
- use fractions to measure ingredients.
- read to perform a task.
- gain a better understanding of greater than and less than.

Materials/Resources/Printed Materials:

- Copies of all Student Resource Sheets #1-13
- A copy of “Cook~a~Doodle~Doo” by Janet Stevens and Susan Stevens Crummel
- Overhead fraction circles
- Scissors and crayons
- Measuring cups and spoons (enough for each group)
- Strawberry Shortcake ingredients (see recipe in the book)
- Individual strawberry shortcake shells (enough for each group)
- Plastic knives
- Highlighters
- Teacher Resource Sheets #1-3

Development/Procedures:

Activity 1: Understanding Fair Shares

Provide each group of 3 to 4 students with a measuring cup and a copy of Student Resource Sheet #1, **FRACTION MAT**. Designate a recorder and spokesperson for each group. Have each group look at the measuring cup and record on the fraction mat all of the fractions that they see. Have a group discussion about the fractions that each group has recorded. Ask students when they would use this type of cup. Explain to the class that they are going to read a book about how a hen creates strawberry shortcake. The rooster uses this type of cup often and you will be listening for some of the fractions that you have written on your fraction mat. As you hear a fraction in the story, circle it on your mat.

Teacher reads the story **COOK~A~DOODLE~DOO** by Janet Stevens and Susan Stevens Crummel.

After the story, each group will report to the class the fractions that they heard mentioned in the book. Explain to the students that today they are going to work with these fractions and understand more about them.

Each group will receive one small strawberry shortcake shell and a plastic knife. Explain to each group that they must equally share this cake. Ask them how they can cut their cake so that each person has a fair share. Have the students complete this activity and explain how they made their decision. Ask students why it is important that all parts are equal.

Using the overhead and overhead fraction circles, the teacher will demonstrate how a fraction is a part of a whole. Each group will then write on the back of their fraction mat the fractional piece of the cake that each person received and hold it up for the teacher to check.

Checking for understanding, the teacher will provide students with Student Resource Sheet #2, **SHARE FAIR**. Individually, the students will divide their cakes into the parts given. They will then write the fractional part each person would receive. Check and review answers as a class.

Activity 2: Compare, Compare, Compare!

In order to review yesterday's activities, the teacher will provide a warm-up activity with Student Resource Sheet #3, **BERRY BERRY FUN**. The teacher will direct the students to cut out the six strawberries at the bottom of the worksheet. Next, they will place all the berries on the cake picture. The teacher will ask the following questions and help to generate the correct fractions on the board.

- ✓ You have six strawberries on your cake, if you ate one off the cake, what fraction of strawberries did you eat? (1/6)
- ✓ Take all the strawberries off your cake. The Iguana only wants two strawberries on his cake. Put two strawberries on the cake for the Iguana. What fraction of the set of strawberries does the Iguana have on his cake? (2/6)
- ✓ Remove all strawberries. Put 1/2 of your strawberries on the cake. (3 strawberries)
- ✓ Remove all strawberries. Put 3/6 of your strawberries on the cake. What do you notice about this? (It is equal to one-half, 1/2.)

Next, the students will be provided with Student Resource Sheets #4-6, **CUT YOUR CAKE**. The teacher will read each scenario on Teacher Resource Sheets # 1-2. The students will use their pencil to create the correct cuts in the cake as instructed. The students will then color their cakes.

After completing the activity, students are to cut out each circle and each individual piece of cake creating their own set of fraction circles. Using an overhead set of fraction circles, which correspond to the student created circles, the teacher will guide the students to compare the fractions and determine which piece Rooster would like to have. Ex: Would rooster rather have 1/2, 1/3, or 1/8 of the cake and why?

Provide the students with Student Resource Sheet #7, **TAKE THE CAKE**, a writing prompt. Explain that they will be writing a paragraph and drawing a diagram that explains which piece of cake they would like to have and why.

Activity 3: Fill That Cup

As a warm-up activity the teacher will provide each student with a set of **FRACTION ATTACK** cards found on Student Resource Sheet #8. The students will color in each of the fractional parts listed below each card.

Students will cut the cards and shuffle them. Next, they will divide them equally between two players. On the count of three, each student will place a card on the desktop face up. The students will compare the two cards. The student who laid down the card with the larger fraction will "capture" both cards. If the students lay down equal fraction cards, they will throw another card and the larger fraction card will "capture" all the cards on the table. The person "capturing" the most cards at the end will be the victor.

The teacher will explain to the group that tomorrow they will be making their own strawberry shortcake. The teacher will explain that they will have to measure ingredients in order to make their cake. Therefore, they will need to examine measuring cups determine ways that fractions can be compared.

The teacher will give two (2) clear measuring cups to each group of students and a pitcher of water colored with food coloring (color optional). The teacher will guide the students through this activity by giving the following directions.

- ✓ Fill one of your measuring cups 1/2 full. Fill the second measuring cup 2/3 full. Compare and decide which cup is holding the most liquid. Empty both cups into the pitcher of water.
- ✓ Fill one of your measuring cups 2/3 full. Fill the second measuring cup 1/3 full. Compare and decide which cup is holding the most liquid. Empty both cups into the pitcher of water.
- ✓ Fill one of your measuring cups 1/3 full. Fill the second measuring cup 1/2 full. Compare and decide which cup is holding the most liquid. Empty both cups into the pitcher of water.
- ✓ Fill one of your measuring cups 1 cup full. Fill the second measuring cup 3/3 full. Is there a 3/3 labeled on your measuring cup? If you had to label it, where would it go? Why don't they label it?

Next, the teacher will provide the students with Student Resource Sheet #9, **WHICH IS MORE?** Using their measuring cups as guides, the students will compare the fractions and determine which one is greater.

Activity 4: Make, Bake and Take!

As a warm-up, each group of students will be provided with a set of measuring utensils that they will be using to make the cake. The students will be given five minutes to compare and contrast the different utensils and their uses. They should pay special attention to the fractions on the tools.

The teacher will place a copy of the recipe from the book Cook~a~Doodle ~Doo on the overhead. As a group, the teacher will review the recipe. Discuss the fractions involved in the recipe. Have each group find and hold up the utensils that they will need for each section of the recipe.

The teacher can choose to make the cake as a demonstration or each group may read to perform the task.

Students and teacher make the strawberry shortcake following the recipe.

While the cake is baking, students will be provided with the **WHAT'S COOKING** activities, Student Resource Sheets #13, to complete.

After the cake is completed, the students will advise the teacher on how to divide the cake so that each person will get a fair share. If cakes are baked in small groups, students will decide how to divide the cakes fairly. Students will then write a fraction showing the fractional part of the cake that they received. ENJOY!

Performance Assessment:

This unit will have on-going assessments including:

- Successful group dynamics
- Completion of all activities
- Teacher Observations
- Correct written language
- Scoring Rubric for performance assessment (Teacher Resource Sheet #3)

Extension/Follow Up:

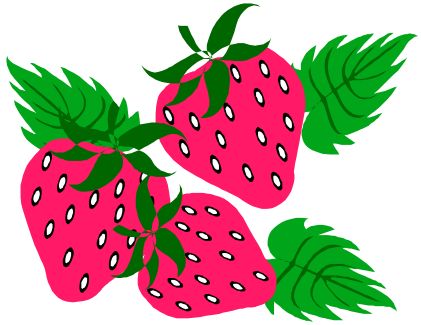
The teacher could follow this unit with activities such as:

- Reading book Gator Pie, by Louise Mathews
- Pattern block activities
- Providing students with a grocery price list and recipe. Given a specific amount of money have students determine if they will be able to purchase ingredients to make the recipe.
- Have students create their own recipe for Strawberry Shortcake.

Authors:

Rhonda Ellis
Salisbury Middle School
Wicomico County Public Schools, MD

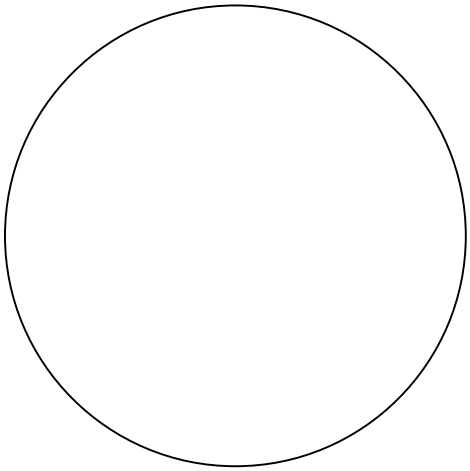
Holly Hatton
Beaver Run Elementary
Wicomico County Public Schools, MD



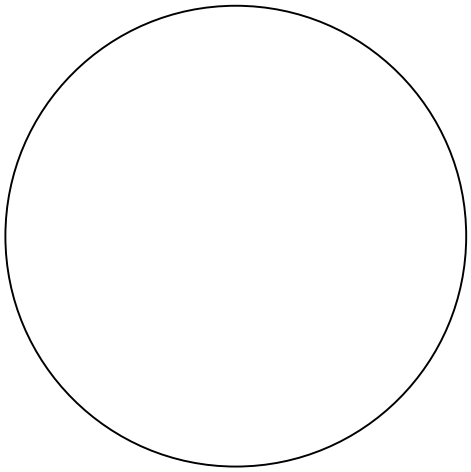
FRACTION MAT

SHARE FAIR!

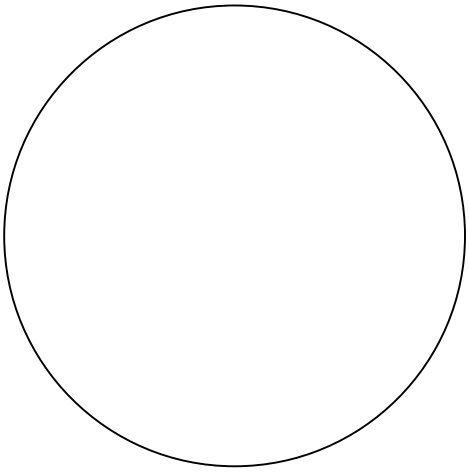
Using your pencil, divide each cake into the correct number of pieces. Remember that all pieces in one cake must be the same size. Fill in each blank with the correct fraction.



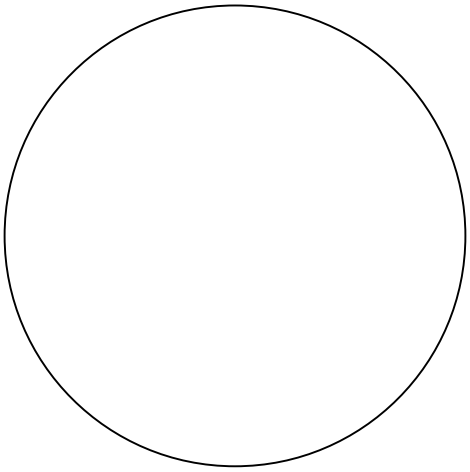
This cake will be shared equally by 2 people. Each person will get of the cake.



This cake will be shared equally by 4 people. Each person will get of the cake.



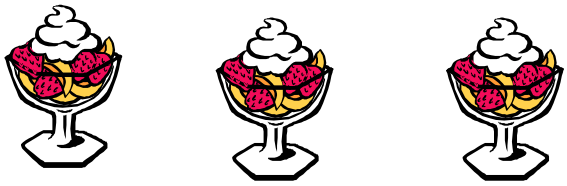
This cake will be shared equally by 6 people. Each person will get ____ of the cake.

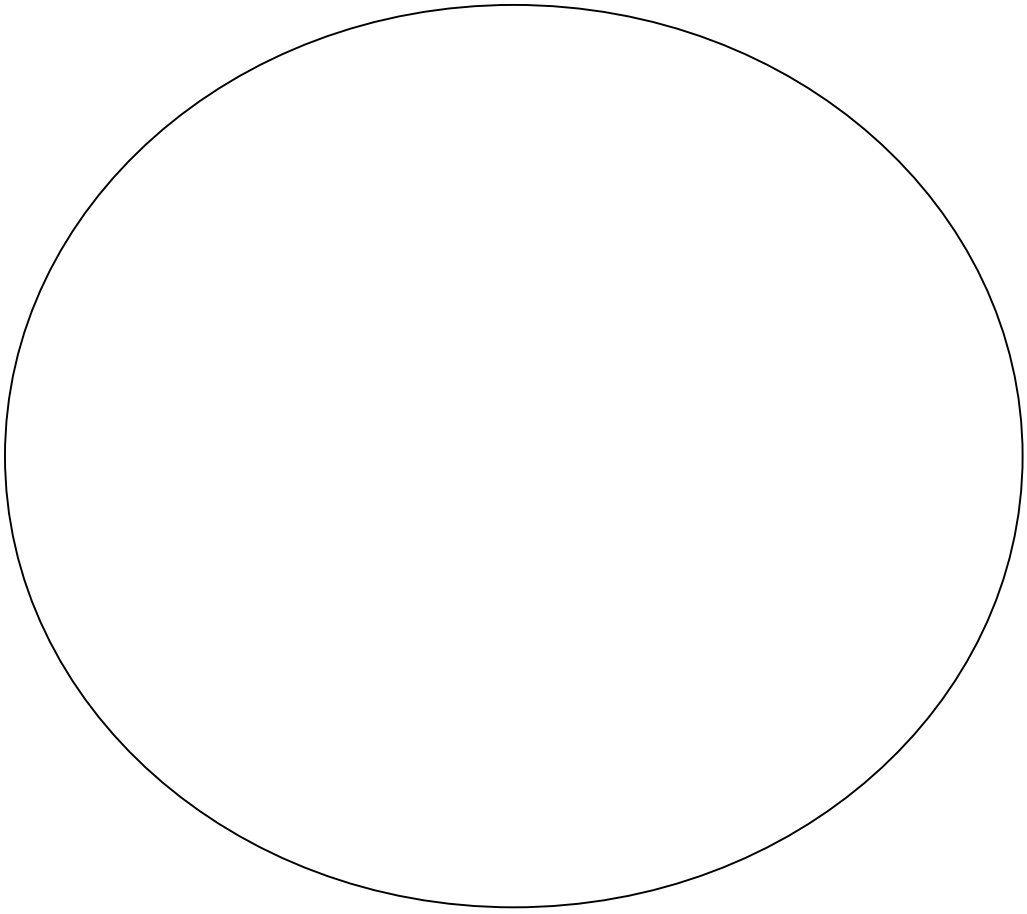


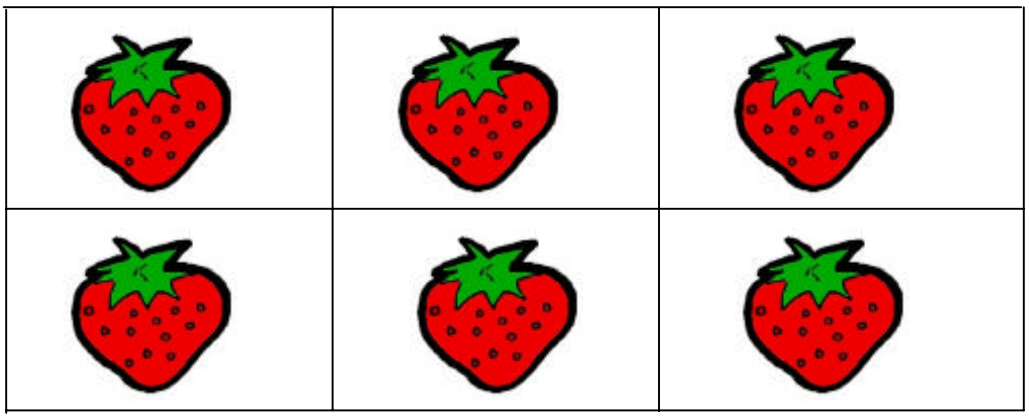
This cake will be shared equally by 8 people. Each person will get ____ of the cake.

Follow your teacher's directions.

BERRY BERRY FUN







CUT YOUR CAKE
Teacher Scenarios

Big Brown rooster was baking his strawberry shortcake. Just as it was coming out of the oven, Dog walked by. Smelling something good, he knocked on the door and invited himself in. Rooster told Dog that he was welcome to stay for strawberry shortcake and began to cut his cake.

Directions to students: Find circle #1. With your pencil, trace the lines where Rooster will cut the cake so that he and Dog can each have a fair share. Write the fraction on each piece of cake. Color the circle blue.

Just as Rooster was about to cut the cake, Cat and Goose walked in. "Well, Well, stated Rooster, " I guess I will have to cut a few more pieces so everyone can have a fair share."

Directions to students: Find circle #2. Trace the lines where Rooster will cut the cake so he, Dog, Cat and Goose can all have a fair share. Write the fraction on each piece. Color the circle red.

All four animals were sitting around the table, anxious to begin eating, when Turtle and Iguana dropped in. "We smelled something wonderful and could not help but drop in and see if you could spare a bite to eat?" Rooster looked at all of his friends and graciously set two more places at the table. Smiling, he began to cut the cake.

Directions to students: Find circle #3. Trace the lines where Rooster will cut the cake so that he, Dog, Cat, Goose, Turtle, and Iguana can all have a fair share of shortcake. Write the fraction on each piece. Color the circle green.

Just before the knife touched the cake, Rooster heard one more knock at the door. Before he could even answer the door, Potbellied Pig barged in. "Something smells good!", oinked the pig. "Mind if I pull up a chair?" "Of course not." stated Rooster. "You are just in time!" Finally, Rooster was able to cut his cake. He also cut a piece for you!

Directions to students: Find circle # 4. Trace the lines where Rooster will cut the cake so that he, Dog, Cat, Goose, Turtle, Iguana, Potbellied Pig and you can finally enjoy the cake. Write the fraction on each piece. Color the circle yellow.

Ask the students the following questions as they look at their completed circles:

- ✓ Point to the cake that is cut into the largest pieces.
- ✓ Point to the cake that is cut into the smallest pieces.
- ✓ Point to the cake that is cut into fifths.
- ✓ Point to the cake that is cut into fourths.

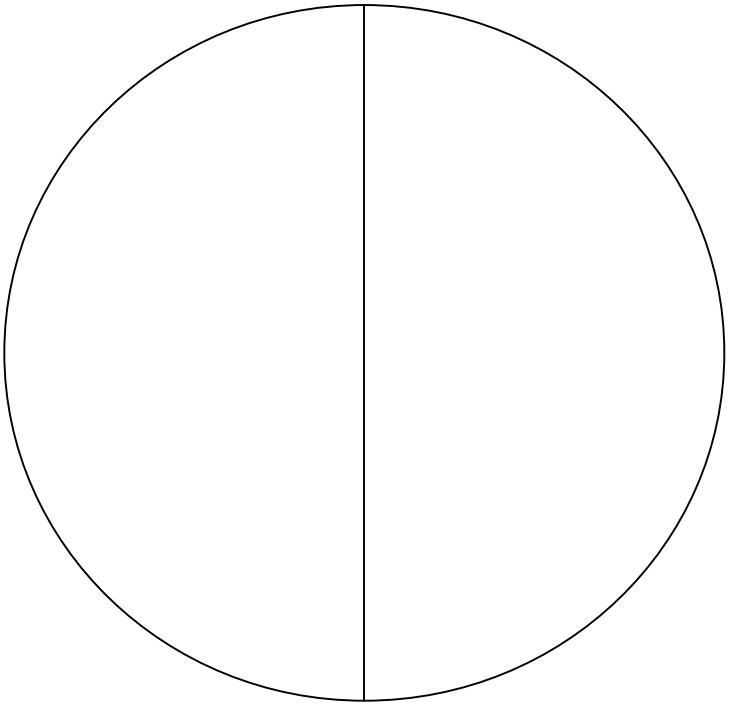
Hand each student the **DECORATE ROOSTER'S CAKE** sheet. After decorating this cake, have the students cut out each individual piece of cake for use with the next activity.

Name_____ Date_____

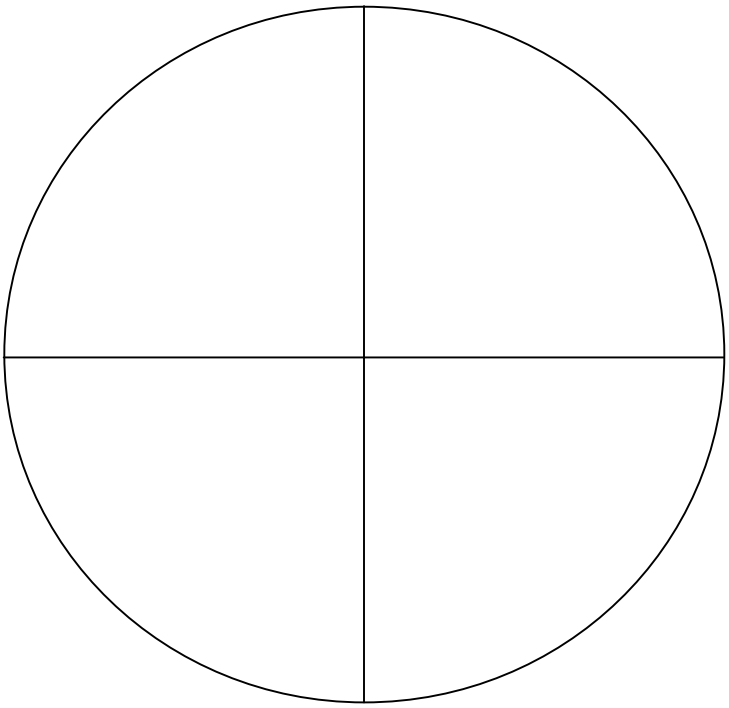
CUT YOUR CAKE!

Listen to your teacher's directions to complete this activity.

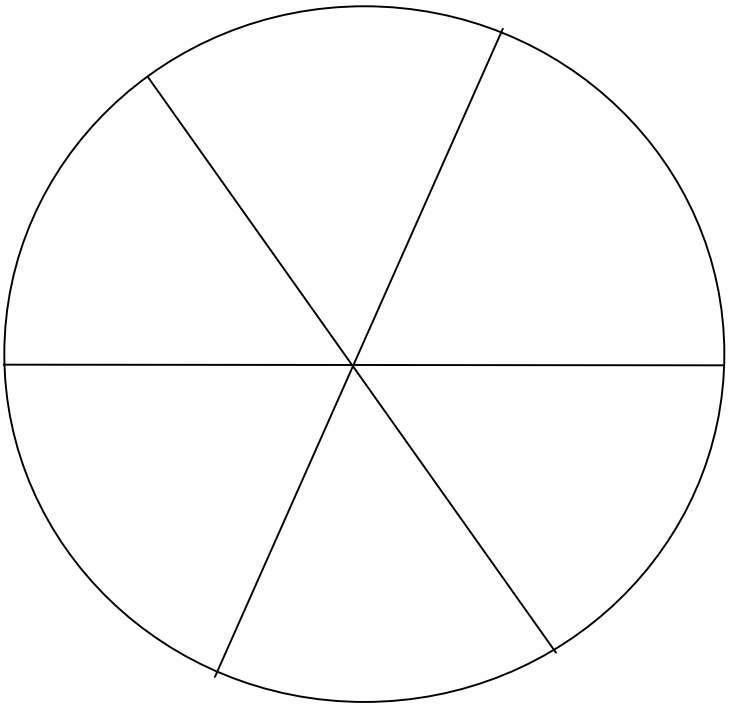
1)



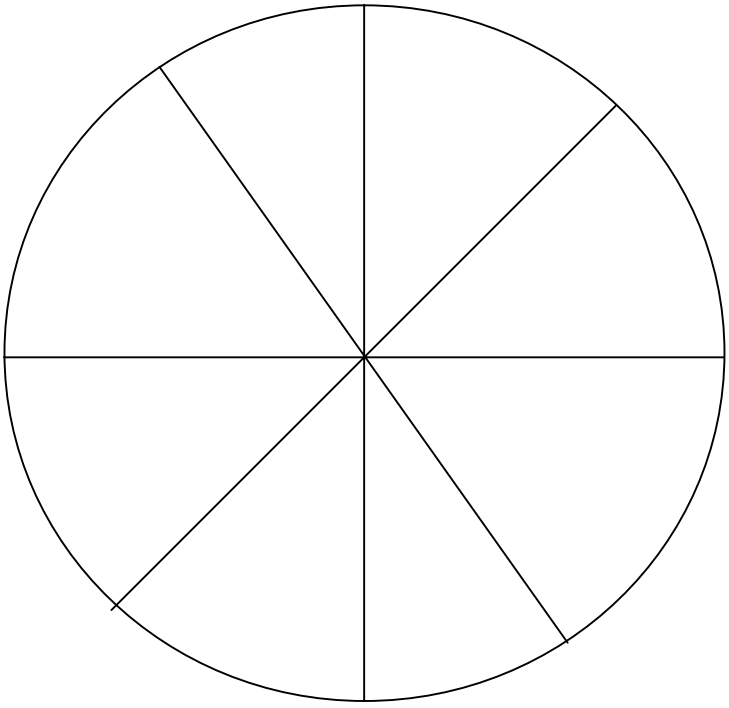
2)



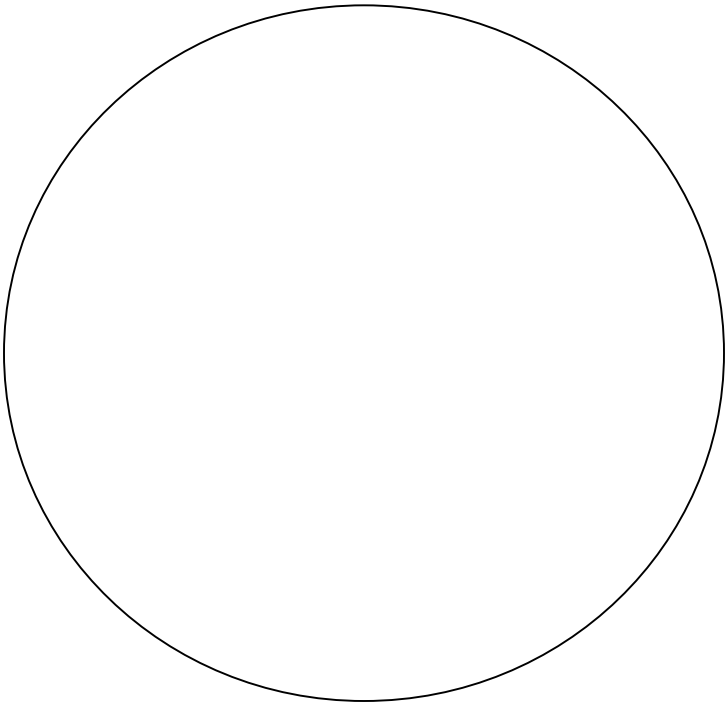
3)

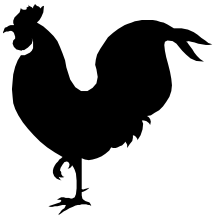


4)



Decorate Rooster’s cake as you think it would look before it is cut.



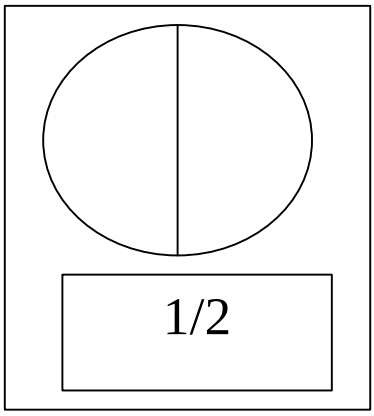

Student Resource Sheet #7

TAKE THE CAKE

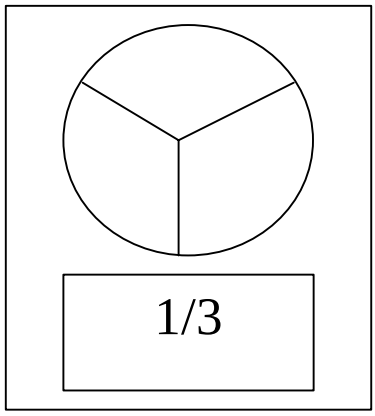
Rooster is at a party and he decides he would like to have a bite to eat. He visits the food table and notices two (2) cakes. One is cut into eight (8) slices and the other one is cut into two (2) slices. "Oh my", Rooster stated, "I can have one-eighth (1/8) of a cake or one-half (1/2) of a cake. I am really hungry." In a paragraph, briefly explain what portion of a cake Rooster should choose if he is very hungry. Draw a picture on the back of this sheet showing the cake Rooster chose and how it is cut.

Fraction Attack

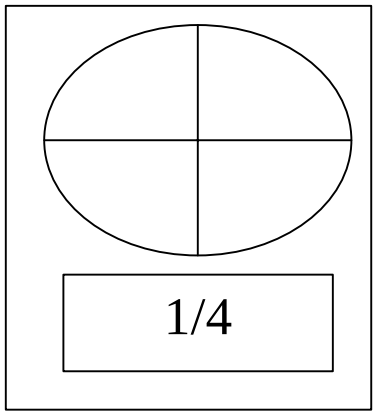
Student Resource Sheet #8



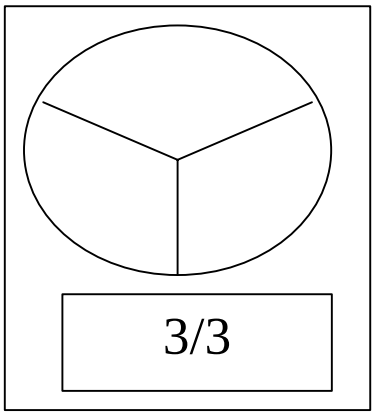
1/2



1/3

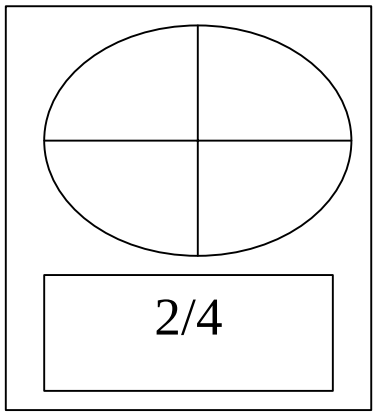


1/4

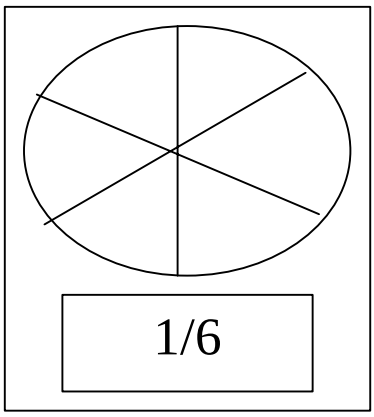


3/3

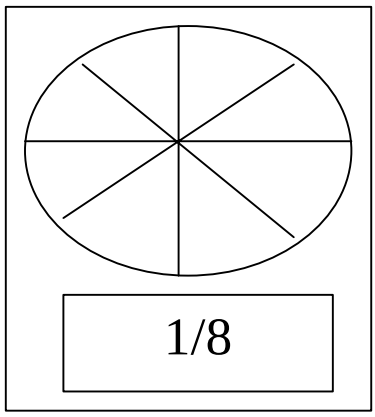
1 whole



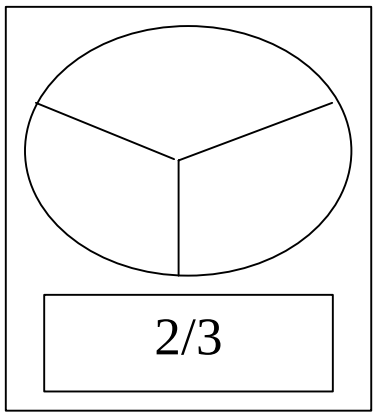
2/4



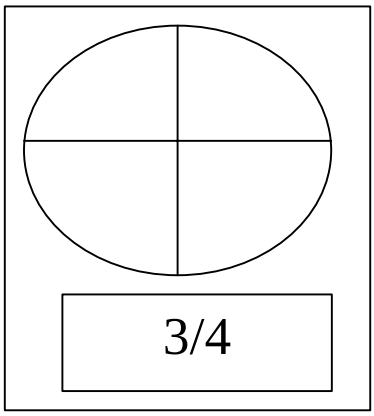
1/6



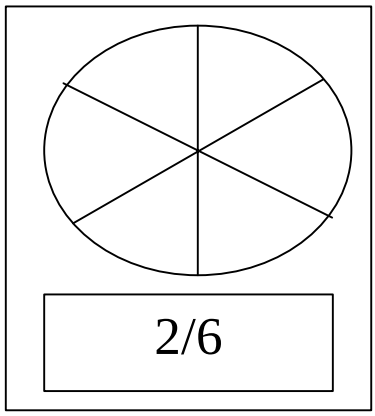
1/8



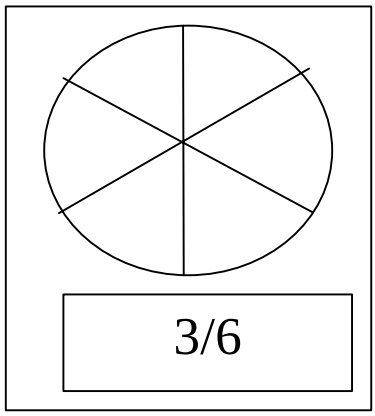
2/3



3/4



2/6



3/6

Name_____

Which is more?

Directions: Compare each set of fractions using greater than, less than, or equal signs (. , . , .). Use your measuring cup to help you compare the fractions.

1. $\frac{1}{2}$ ☐ $\frac{1}{3}$

2. $\frac{1}{3}$ ☐ $\frac{2}{3}$

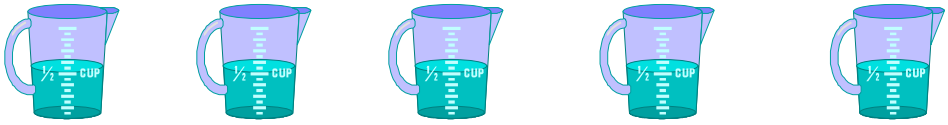
3. 1 ☐ $\frac{1}{2}$

4. $\frac{1}{2}$ ☐ $\frac{2}{3}$

5. 1 ☐ $\frac{3}{3}$

6. $\frac{3}{3}$ ☐ $\frac{1}{3}$

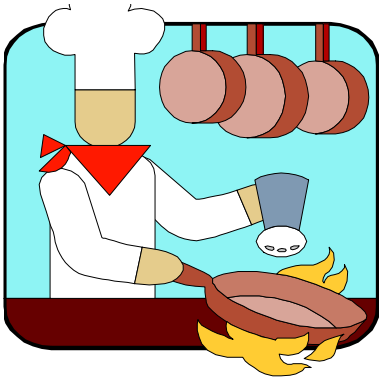
In one or two sentences explain how your measuring cup helped you to compare the fractions and find your answers.



_____

_____

_____



WHAT'S COOKING?

Rooster let Potbellied Pig borrow his Strawberry Shortcake recipe. Potbellied Pig copied down the recipe, but when he made the shortcake, it did not taste very good at all! He asked Rooster for help. "Did you copy my recipe correctly?" Rooster asked. "Well, I think so!" said Pig, "Take a look!" "Well," Rooster said, "the problem is right here!"

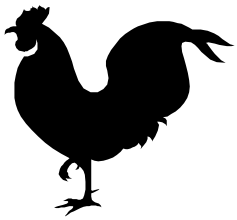
Carefully look at each recipe and see if you can figure out why Potbellied Pig's recipe did not taste good. Highlight what is wrong in Pig's recipe.

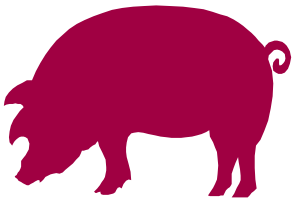
ROOSTER'S RECIPE

2 cups flour, sifted
1 teaspoon vanilla
2 tablespoons sugar
1 tablespoon baking powder
1/2 teaspoon salt
1/2 cup butter
1 egg, beaten
2/3 cup milk
4 cups of strawberries
1 cup of whipped cream

PIG'S RECIPE

2 cups flour, sifted
1 teaspoon vanilla
2 tablespoons sugar
1 tablespoon baking powder
1/4 teaspoon salt
1/3 cup butter
1 egg, beaten
1/3 cup milk
4 cups of strawberries
1 cup of whipped cream





What's Cooking? Part 2

Use your highlighted information to help you answer the following questions:

1) Rooster's recipe calls for _____ teaspoon of salt.

Pig's recipe calls for _____teaspoon of salt.

Pig's recipe does not taste good because he used

too much salt OR not enough salt.
(circle one)

Draw a picture showing one-half (1/2) and a picture showing one-fourth (1/4). Circle the picture that shows the larger fraction.

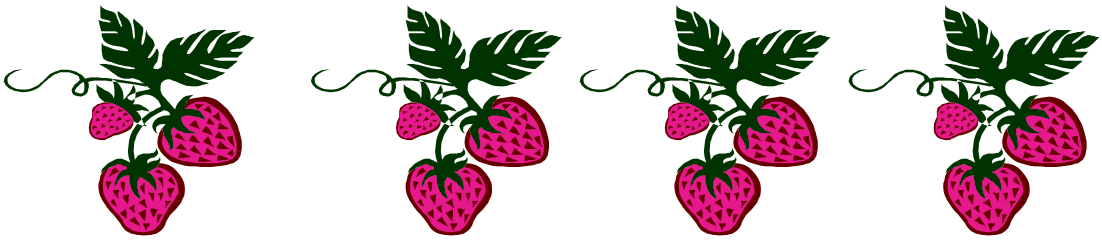
2) Rooster's recipe calls for _____ cup of butter.

Pig's recipe calls for _____ cup of butter.

Pig's recipe does not taste good because he used

too much butter OR not enough butter.
(circle one)

Draw a picture showing one-half (1/2) and a picture showing one-third (1/3). Circle the picture that shows the larger fraction.



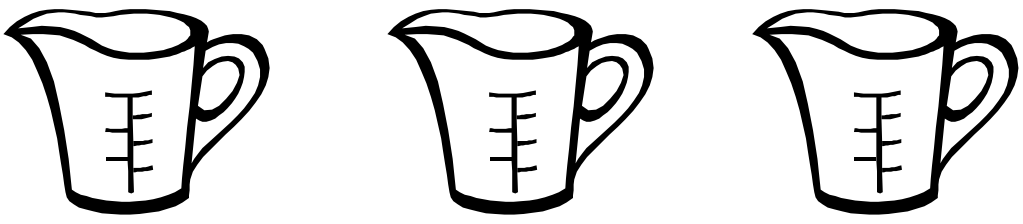
3) Rooster's recipe calls for _____ cup of milk.

Pig's recipe calls for _____ cup of milk.

Pig's recipe does not taste good because he used

too much milk OR not enough milk.
(circle one)

Draw a picture showing two-thirds (2/3) and a picture showing one-third (1/3). Circle the picture that shows the larger fraction.



What's Cooking Scoring Rubric:

Teacher Resource Sheet #3

In order to receive a score of 2, 1, or 0 refer to the chart below:

2

- Students will answer correctly all 3 problems.
- Students will demonstrate an understanding of fractional parts through their drawings.
- Students will highlight mistakes in the given recipe.
- Students will correctly identify the larger fraction in 3 drawings.

1

- Students will answer correctly 2 of the 3 question scenarios.
- Students will have an understanding of some of the fractional parts in their drawings.
- Students will highlight 2 out of 3 mistakes in the recipe given.
- Students will correctly identify 2 of the 3 larger fractional drawings.

0

- Students scoring 1 or less on any given question should be encouraged to KEEP TRYING!!!